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| NG, CHRISTINE Y | |
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 09/786,604 | RITTER, GERHARD | |
| | Examiner | Art Unit | |
| | CHRISTINE NG | 2616 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *21 May 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *35-48* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *35-48* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 November 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 35 recites the limitation "the one of the base stations" in lines 7-8. There is insufficient antecedent basis for this limitation in the claim.

### *Claim Rejections - 35 USC § 102*

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 35, 42, 45 and 46 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,583,870 to Delprat et al.

Referring to claims 35 and 46, Delprat et al disclose a method of measuring transmission characteristics of radio channels in a radio communications system having base stations (Figure 2, BTS1, BTS2) and a radio station (Figure 2, $M_A$-$M_D$), the radio communications system utilizing a timeslot structure (Figure 1B) in a time frame for transmitting data. The method comprises:

Transmitting the data as bursts (Figure 1B, any of time slots IT0-1T7) from a first of the base stations to the radio station, each burst having a channel measurement sequence (training sequence), the first of the base stations transmitting the channel measurement sequence in at least one timeslot (Figure 1B, time slots IT2, IT3, IT6, IT7) in which no data is transmitted from the one of the base stations to a radio station. In Figure 1B, time slots IT2, IT3, IT6, IT7 do not carry user information so are used instead to carry signaling data (Column 5, lines 1-18). The signaling data can be a training sequence such as in a synchronization burst (Column 5, lines 29-40).

Referring to claim 42, Delprat et al disclose that a channel measurement sequence (training sequence) in a predetermined timeslot (Figure 1B, time slots IT0) in the time frame has a special identifier (rank 0). Timeslot IT0 contains a synchronization sequence, identified by a rank of 0. Refer to Column 1, lines 39-49; Column 4, lines 61-63; and Column 5, lines 55-60.

Referring to claim 45, Delprat et al disclose that the predetermined timeslot is a 0-th timeslot. Refer to Column 1, lines 39-49; Column 4, lines 61-63; and Column 5, lines 55-60.

### *Claim Rejections - 35 USC § 103*

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 36-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,583,870 to Delprat et al in view of U.S. Patent No. 6,125,125 to Narasimha et al.

Referring to claim 36, Delprat et al do not disclose that the channel measurement sequence is transmitted using at least one of (i) a constant power level and (ii) a number of base stations at the same time.

Narasimha et al disclose a method of transmitting the channel measurement sequence (training sequence) using (ii) a number of base stations at the same time. All base stations use a synchronizing mechanism to transmit frames to mobile stations at the same time so that the training sequences will be received by the mobile stations at virtually the same time. All base stations will be in substantial timing synchronization according to a GPS signal. Refer to Column 3, lines 5-49 and Column 4, line 58 to Column 5, line 5. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include that the channel measurement sequence is transmitted using at least one of (i) a constant power level and (none) (ii) a number of base station transmitting at the same time. One would have been motivated to do so to ease "handoff procedures when a mobile travels from one cell to another cell" (Column 5, lines 6-13).

Referring to claim 37, Delprat et al do not disclose that the channel measurement sequence is transmitted in the middle of a burst.

Narasimha et al disclose that the channel measurement sequence (training sequence) is transmitted in the middle of a burst. The base station "transmits a training

sequence in the middle of every time slot so that the mobile station can learn the characteristics of the intervening radio path and train its equalizer" (Column 1, lines 38-41). Refer also to Column 3, lines 5-8. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include that the channel measurement sequence is transmitted in the middle of a burst. One would have been motivated to do so to follow the standards of GSM systems.

Referring to claim 38, Delprat et al do not disclose wherein the base stations are synchronized.

Narasimha et al disclose that all base stations in a system use a synchronizing mechanism to transmit frames to mobile stations at the same time so that the training sequences will be received by the mobile stations at virtually the same time. All base stations will be in substantial timing synchronization according to a GPS signal. Refer to Column 3, lines 5-49 and Column 4, line 58 to Column 5, line 5. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include wherein the base stations are synchronized. One would have been motivated to do so to ease "handoff procedures when a mobile travels from one cell to another cell" (Column 5, lines 6-13).

7. Claims 39-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,583,870 to Delprat et al in view of U.S. Patent No. 6,125,125 to Narasimha et al, and in further view of U.S. Patent No. 5,274,669 to Klank et al.

Referring to claim 39, Delprat et al and Narasimha et al do not disclose that cyclic correlation is used for channel measurement.

Klank et al disclose in Figure 3 a method of using cyclic correlation to determine the channel pulse response. Refer to Column 1, lines 56-65; Column 3, line 57 to Column 4, line 14; and Column 5, lines 11-14. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include that cyclic correlation is used for channel measurement. One would have been motivated to do so so that the same basic training sequence can be utilized to determine channel measurements, thereby simplifying the system.

Referring to claim 40, Delprat et al do not disclose that individual base stations use a same channel measurement sequence.

Narasimha et al disclose in Figure 1 that "the training sequence transmitted from one BTS 14 is different than the training sequence transmitted by the other BTS's 14 that can cause co-channel interference" (Column 3, lines 9-11). This implies that BTS's that will not be subject to co-channel interference can have the same training sequence. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include that individual base stations use a same channel measurement sequence. One would have been motivated to do so so that the same basic training sequence can be used by all mobile stations in a system; thereby simplifying the system since all mobile stations tune into the same training sequence if it does not cause co-channel interference.

Referring to claim 41, Delprat et al do not disclose that the channel measurement sequence is transmitted with a different code phase by different base stations.

Narasimha et al disclose in Figure 1 that the "training sequences are orthogonal and will not interfere with each other if received at a mobile unit at precisely the same time". Refer to Column 3, lines 12-14. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include that the channel measurement sequence is transmitted with a different code phase by different base stations. One would have been motivated to do so so that the same basic training sequence can be used by all mobile stations in a system; thereby simplifying the system since all mobile stations tune into the same training sequence if it does not cause co-channel interference.

8. Claims 43 and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,583,870 to Delprat et al in view of US Patent No. 4,577,334 to Boer et al.

Delprat et al disclose that the same channel measurement sequence (training sequence) is used in the predetermined time slot (Figure 1B, time slot IT0) as is used in other time slots in the time frame (Figure 1B, time slots ITI-IT7). Refer to Column 5, lines 55-60. Refer to the rejection of claims 35 and 46.

Delprat et al do not disclose that phase modulation is used in the channel measurement sequence in the predetermined time slot [claim 43] and that a 180° phase modulation of the channel measurement sequence is used in the predetermined timeslot from one time frame to a next time frame [claim 44].

Boer et al disclose in Figure 1 that the first part of a signal received over line 1 is a receiver training sequence that is phase modulated with two alternating phases

modulated at a rate $f_b$ on the carrier frequency $f_c$. Refer to Column 3, lines 35-39. As shown in Figure 2B, the phase alternations can be formed by 180° phase jumps. Refer to Column 3, lines 59-62. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include that phase modulation is used in the channel measurement sequence in the predetermined time slot [claim 43] and that a 180° phase modulation of the channel measurement sequence is used in the predetermined timeslot from one time frame to a next time frame [claim 44]. One would have been motivated to do so since phase modulation is a common form of modulation to carry signals across a channel, allowing the use of a single carrier frequency in which the signal is encoded into the phase changes of the carrier. A 180° phase modulation offers the advantage of only having to detect two phase changes at the receiver in order to recover the original signal, thereby minimizing error.

9. Claims 47 and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No 5,583,870 to Delprat et al in view of U.S. Patent No. 5,598,404 to Hayashi et al.

Referring to claim 47, Delprat et al do not disclose that the radio communication system is a TDD radio communication system.

Hayashi et al disclose that in a TDD system, the transmission/reception is performed in the same frequency band on the basis of time division. Refer to Column 2, lines 62-65. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include that the radio communication system is a TDD radio communication system. One would have been motivated to do so since, as

compared with FDD, TDD offers more efficient use of the spectrum and bandwidth because each user is allocated only one channel and is comparatively more flexible, less complex and cheaper.

Referring to claim 48, Delprat et al do not disclose that the radio communication system is a FDD radio communication system.

Hayashi et al disclose that in a FDD system, two frequency bands, which are sufficiently spaced apart from each other, are respectively assigned to transmission and reception. Refer to Column 2, line 65 to Column 3, line 2. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include that the radio communication system is a FDD radio communication system. One would have been motivated to do so because, as compared with TDD, FDD does not introduce latency between the transmit and receive cycles, allows transmission and reception at the same time, and avoids propagation delays that limit the distance between the user and the station.

***Response to Arguments***

10. Applicant's arguments filed May 21, 2008 have been fully considered but they are not persuasive.

Referring to the argument of Delprat et al (page 7, line 3 to page 8, line 11): Delprat et al disclose that the training sequence is transmitted in a timeslot in which no data is transmitted. In Figure 1B, time slots IT2, IT3, IT6, IT7 do not carry user information so are used instead to carry signaling data (Column 5, lines 1-18). The signaling data can be a training sequence such as in a synchronization burst (Column

5, lines 29-40). Therefore, since no data is transmitted in time slots IT2, IT3, IT6, IT7, a training sequence is transmitted instead.

***Conclusion***

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISTINE NG whose telephone number is (571)272-3124. The examiner can normally be reached on M-F; 8:00 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Firmin Backer can be reached on (571) 272-6703. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

C. Ng
August 11, 2008

/FIRMIN BACKER/
Supervisory Patent Examiner, Art Unit 2616